October, 2006

Express
Ethernet Switch:
LB9017A-R4

CUSTOMER
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INFORMATION

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FCC Statement

The FCC (Federal Communications Commission) restricts the amount of radio frequency emission and radiation coming from computer equipment.

The equipment introduced in this manual has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user is required to correct the interference at his/her own expense.

Any changes or modifications not expressly approved by the manufacture would void the user's authority to operate the equipment.

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Preface

This manual describes how to install and use the 16 Ports Smart Ethernet Switch. The TX ports of the switch introduced here auto-negotiates the presence of 10/100Mbps and full/half-duplex mode and auto-MDIX. In addition, it allows an optional 100BaseFX multi-mode or single-mode fiber module, enabling long distance connection.

To get the most out of this manual, you should have an understanding of networking concepts such as bridging, IEEE 802.3 10BaseT Ethernet, IEEE 802.3u 100BaseTX/FX Fast Ethernet, and local area networks (LANs).

For more information about these topics, please refer to the Appendices.

In this manual, you will find:

- Introduction on the Switch
- Product features
- Illustrative LEDs functions
- Installation instructions
- Specifications

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Product Overview

Front View

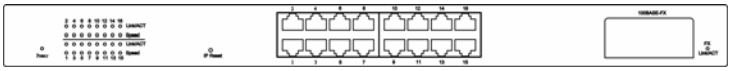


Figure 1: 16 Ports Smart Ethernet Switch

Package Contents

When you unpack the product package, you shall find these items listed below.

- ✓ *The 16 Ports Switch*
- ✓ *One AC power cord*
- ✓ *User's Manual*

Please inspect the contents, and report any apparent damage or missing items immediately to your authorized reseller.

Product Features

- Provides 16 × 10/100Mbps ports using RJ-45 connectors
- An optional single-port fiber module allows:
  - *100BaseFX multi-mode fiber with SC, ST, MT-RJ, VF-45 or LC connector*
  - *100BaseFX single-mode fiber with SC or ST connector*
  - *100BaseFX WDM single-mode fiber with SC connector*
- Auto-negotiation for speed and duplex mode on TX ports
- Auto-MDIX for all TX ports
- 4K MAC addresses, 1.5M bits Buffer Memory
- Store-and-forward mechanism
- True non-blocking architecture
- Full wire speed forwarding rate
- Broadcast storm filtering control
- Back-pressure and IEEE 802.3x compliant flow control
- System, IP Configuration, Port, Port-based VLAN, Trunking, QoS Mode, and QoS Priority settings through the Web-based browser.
- Press the Front panel IP Reset push button to reset the Ethernet Switch back to the default System and IP Address settings. (The Port, VLAN, Trunking, QoS Mode, and QoS Priority settings will remain the same as when they were last saved).
- Front panel port and power status LEDs
- Standard 19" rackmount size, one-unit in height

Front Panel Display

The LED indicators on the front panel provide you with instant feedback on each port status, and help you monitor and troubleshoot the switch.

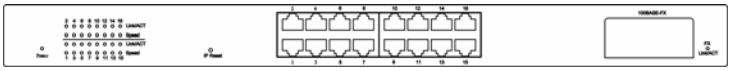


Figure 2: Front Panel LEDs

Power

This LED comes on when the switch is properly connected to power and turned on.

IP Reset Push Button

Press the Front panel IP Reset push button to reset the Ethernet Switch back with the default User Login ID, User Login Password, IP Address, Netmask, and Gateway settings.

Port Status

The RJ-45 ports are numbered from 1 to 16 on the 16-Port Switch.

The LEDs are located on the front panel of the switch, displaying status for each respective port. Please refer to the table below for more information.

Consult the following table for details.

ⓘ Before you use this table for troubleshooting, make sure the switch is properly connected to power and turned on.

Physical Ports

The 16 Ports Switch has sixteen 10/100Mbps ports using RJ-45 connectors and provides one slot for the optional single-port fiber module. The optional module allows fiber type (multi-mode, single-mode, or WDM single-mode fiber) and connector (SC, ST, MT-RJ, VF-45, or LC) at user's discretion.

UNDERSTANDING FRONT PANEL DESIGN

Power LED		On	Power feeding in
		Off	Power switched off
			Improper connection
Port LED	Link/ACT	On	A valid network connection
		Flashing	Transmitting or receiving data ACT stands for ACTIVITY
		Off	Neither connection nor activity
	Speed	On	A valid 100Mbps connection
		Off	A valid 10Mbps connection
100FX Port LED	Link	On	A valid network connection
		Off	No connection
	ACT	Flashing	Transmitting or receiving data ACT stands for ACTIVITY
		Off	Neither transmitting nor receiving data

Installation

Selecting a Site for the Equipment

As with any electric device, you should place the equipment where it will not be subjected to extreme temperatures, humidity, or electromagnetic interference. Specifically, the site you select should meet the following requirements:

- The ambient temperature should be between 32 and 113 degrees Fahrenheit (0 to 45 degrees Celsius).
- The relative humidity should be less than 90 percent, non-condensing.
- Surrounding electrical devices should not exceed the electromagnetic field (RFC) standards for IEC 801-3, Level 2 (3V/M) field strength.
- Make sure that the equipment receives adequate ventilation. Do not block the ventilation holes on each side of the switch or on the rear of the equipment.
- The power outlet should be within 6 feet (1.8 meters) of the switch.

Installation and Placement Instructions

MOUNTED TO 19-INCH STANDARD RACK

Locate the accessories supplied in the product package. Use the rackmount brackets and screws to install the switch into any EIA 19" standard rack.

Step 1: Attach the brackets to each side of the chassis.

Step 2: Apply the screws to each side and secure them tightly.

Step 3: Carefully position the switch into the rack.

Step 4: Align the brackets to the side holes on the rack and use rack screws to secure the chassis with the rack.

Step 5: Proceed to the "Connecting to Power" section.

DESKTOP OR ANY FLAT SURFACE

The switch can sit on desktop or any flat surface with adequate space and ventilation. If you want to place it onto a shelf, make sure the shelf can withstand the weight of the switch.

Step 1: Simply put the switch on the desired place.

Step 2: Ensure the switch receives good ventilation.

Step 3: Proceed to the "Connecting to Power" section.

Optional Fiber Module Installation

Consult the following illustrations before installation.

Step 1: Make sure the power is switched off. The module is not hot-swappable.

ⓘ It may cause electric shock or any possible damage to the switch if the power is not switched off.

Step 2: Remove the module from the static-free container.

Step 3: Unscrew the cover plate of the expansion slot.
(The slot for single-port module is located at the right side of the switch.)

Step 4: Remove the plate.
(Keep it for future use if you decide to remove this module later.)

Step 5: Carefully slide the module into the slot, following the internal plastic guide rails.

Step 6: Once it is fully slid in, snap in the module to make a proper connection.

Step 7: Fasten the module screws.

Step 8: Finally, turn on the power.

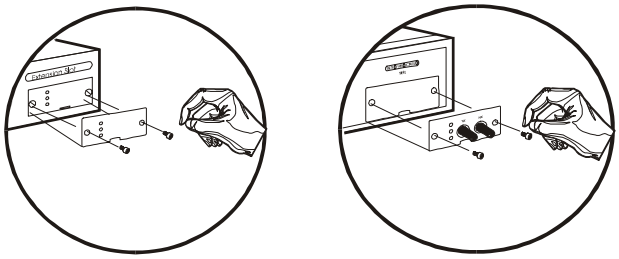


Figure 3: Removal of cover plate Fiber module being installed

Connecting to Power

Locate the supplied AC power cord.

Step 1: Connect the AC power cord to the receptacle at the back of the switch.

Step 2: Attach the plug into a standard AC outlet with a voltage range from 100~240VAC.

Step 3: The power LED on the front panel will then illuminate.

Connecting to Your Network

CABLING

Step 1: First, ensure the power of the switch (and end devices) is turned off.

ⓘ It may cause an electric shock or any possible harm to you if the power is not switched off.

Step 2: Prepare cable with corresponding connectors for each type of port in use.
(Consult the table below for cabling requirements based on connectors and speed considerations.)

Step 3: Connect one end of the cable to the switch and the other end to a desired device.

Step 4: Once the connections between two end devices are made successfully, turn on the power and the switch is operational.

NETWORK SEGMENTATION

The maximum segment distance between a node and a directly connected switch port on a 100BaseFX network is 120km using 10/125 (or 9/125) µm single-mode fiber optic cable. It is capable of a maximum span of 2km when 62.5/125 (or 50/125) µm multi-mode fiber optic cable is used.

Cable Specifications Table

Ethernet Standards	**Connector**	**Port Speed Half/Full Duplex**	**Cable**	**Max. Distance**
10BaseT	RJ-45	10/20 Mbps	Cat. 3, 4 or 5 UTP/STP	100m
100BaseTX	RJ-45	100/200 Mbps	Cat. 5 UTP/STP	100m
100BaseFX Multi-mode	ST, SC, MT-RJ, VF-45, LC	100/200 Mbps	62.5/125µm multi-mode fiber	Up to 2km
100BaseFX Single-mode	SC	100/200 Mbps	10/125µm single-mode fiber	Up to 120km
100BaseFX Single-mode	ST	100/200 Mbps	10/125µm single-mode fiber	Up to 20km
100BaseFX WDM Single-mode	SC	100/200 Mbps	10/125µm single-mode fiber	Up to 40km

Switch Configuration

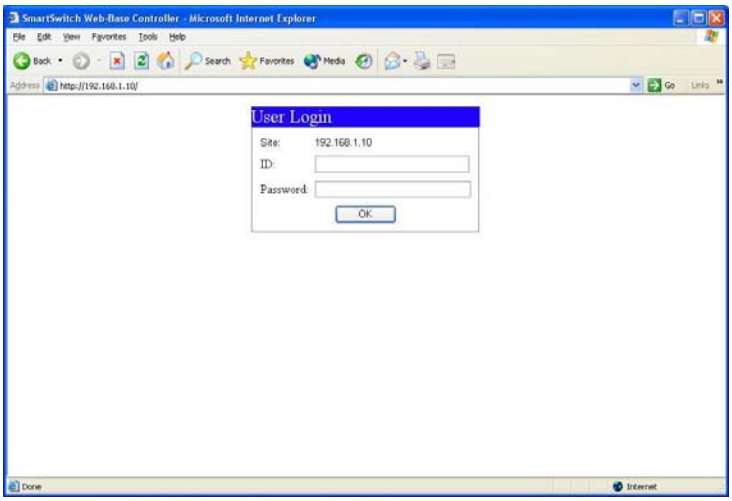
Setting up Web-Based Browser Interface

The Ethernet Switch provides a browser interface that lets you configure and manage the Ethernet Switch from a Web browser (such as Microsoft Internet Explorer or Netscape Navigator) remotely.
By connecting to any port of this Ethernet Switch, you can access the Ethernet Switch's web interface applications directly in your web browser by entering the default IP address of the Ethernet Switch (192.168.1.10). You can then use your web browser to list and manage the Ethernet Switch configuration parameters from one central location.

Logging on to The Ethernet Switch

SWITCH IP ADDRESS

In your web browser, specify the **default IP address** of the Ethernet Switch **(192.168.1.10)**.

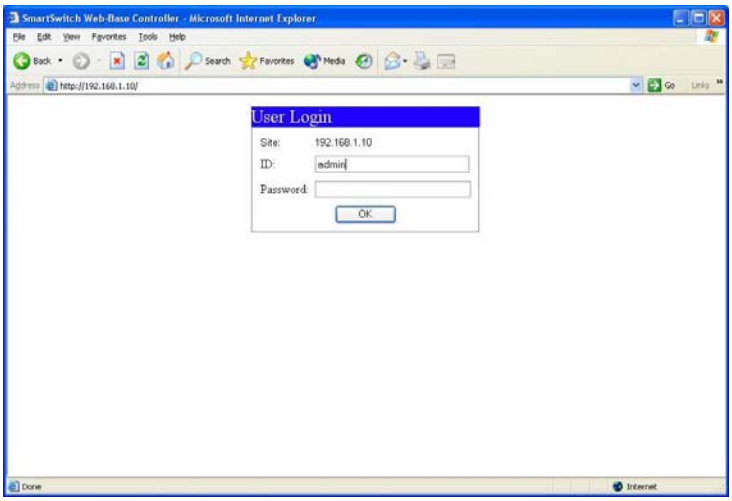


ID

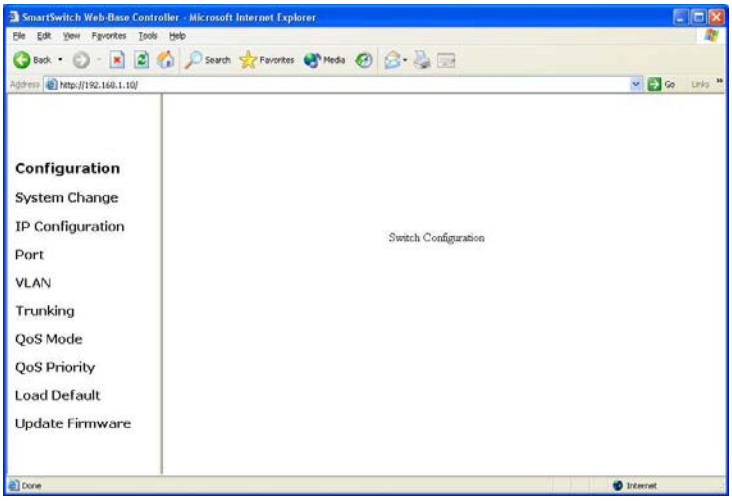
Enter the factory default User Login ID: **admin**.

PASSWORD

Enter the factory default password (no password, **press <Enter> directly**).
Otherwise, enter a user-defined password if you follow the instructions later and change the factory default password.

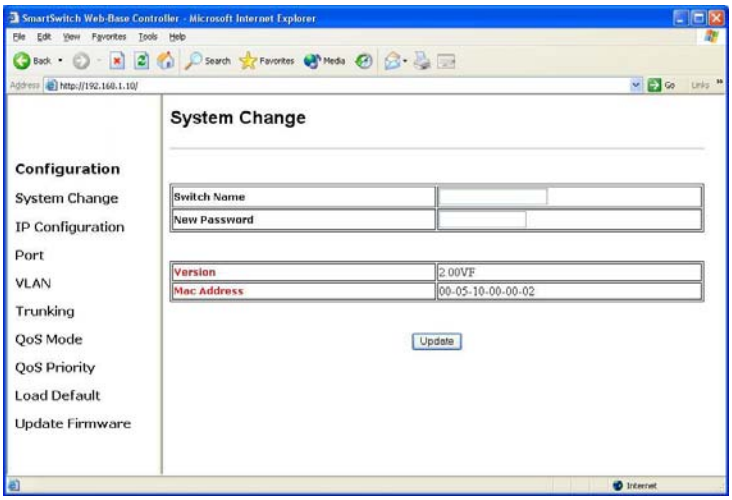

SmartSwitch Web-Base Controller - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://192.168.1.10/
Go Links
User Login
Site: 192.168.1.10
ID: admin
Password:
OK
Done
Internet

Main Menu


SmartSwitch Web-Base Controller - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://192.168.1.10/
Go Links
Configuration
System Change
IP Configuration
Port
VLAN
Trunking
QoS Mode
QoS Priority
Load Default
Update Firmware
Switch Configuration
Done
Internet

SYSTEM CHANGE

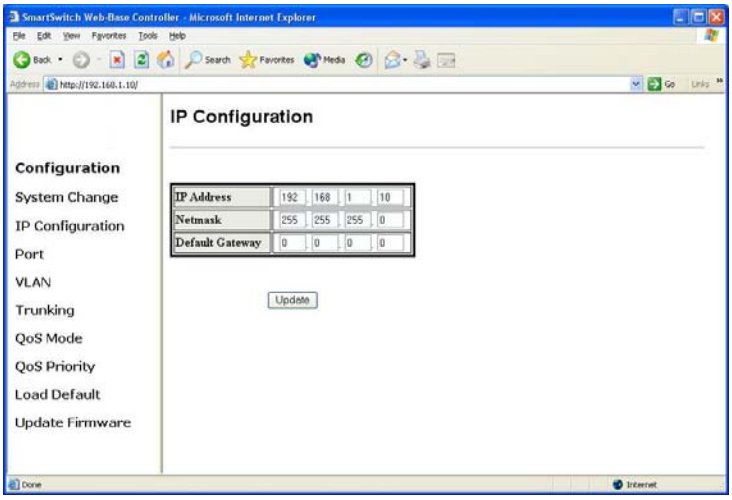
The **System Change** parameters can be displayed by clicking the **System Change** selection in the left sub-menu.



- Switch Name: Type a switch name for this Ethernet Switch.
- New Password: Enter a user-defined password and change the factory default password.
- Update: Click the **Update** button and apply the new System settings.

IP CONFIGURATION

The **IP Configuration** parameters can be displayed by clicking the **IP Configuration** selection in the left sub-menu.

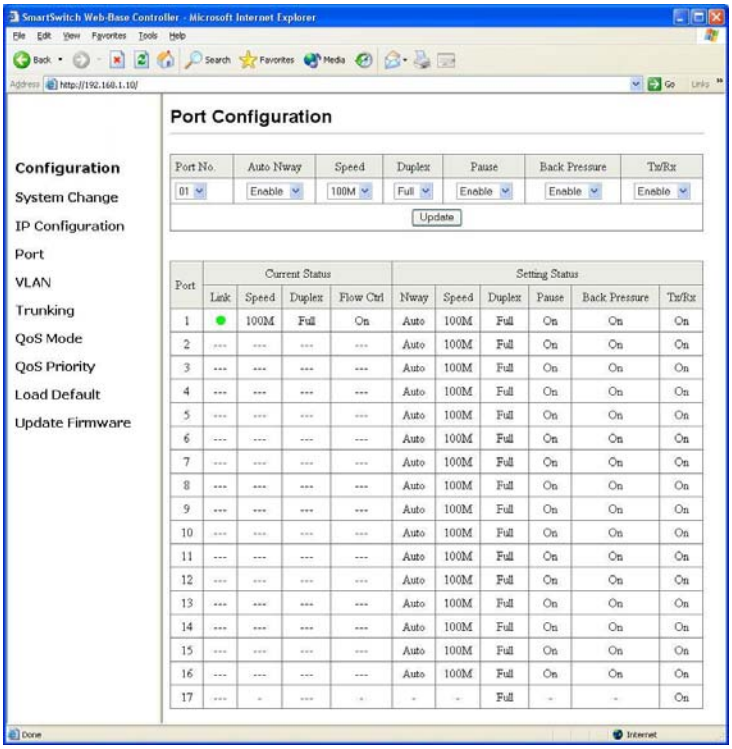


- IP Address, Netmask, Default Gateway: You can see and change the IP Address, Netmask, and Default Gateway of the Ethernet Switch.
- Update: Click the **Update** button and apply the new **IP Configurations**.

  ⓘ Please relogin the switch with the new IP Configuration after you click the update button.

PORT

The **Port** parameters can be displayed by clicking the **Port** selection in the left sub-menu.

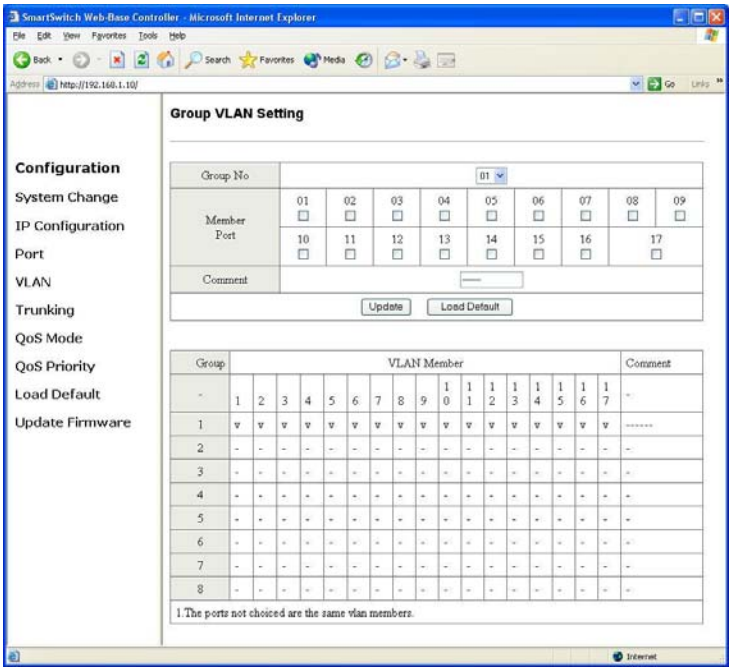


- Port No.: Choose **Port No. 01 ~ 17**.
- Auto Nway: Choose **Enable** or **Disable** to enable or disable **Auto Nway** of the ports.
- Speed: Choose **100M** or **10M** speed for the ports.
- Duplex: Choose **Full** or **Half** Duplex for the ports.
- Pause: Choose **Enable** or **Disable** to enable or disable **Pause** for the ports.
- Backpressure: Choose **Enable** or **Disable** to enable or disable **Backpressure** for the ports.

- Update: Click the **Update** button and apply the new settings of the ports.

VLAN

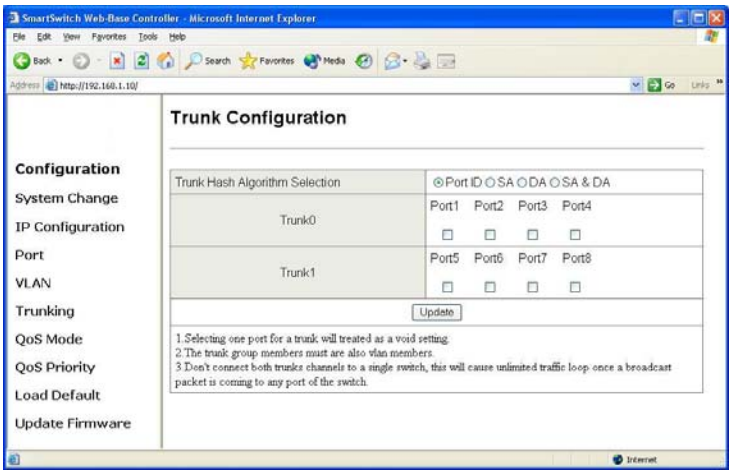
The **VLAN** parameters can be displayed by clicking the **VLAN** selection in the left sub-menu.



- Group No: Click and choose the VLAN **Group No 01 ~ 08**.
- Member Port: Click and choose the **Member Port 01 ~ 17** to be added into the VLAN **Group No 01 ~ 08**.
- Comment: Type Comment for VLAN **Group No 01 ~ 08**.
- Update: Click the **Update** button and apply the new settings of the VLAN groups.
- Load Default: Click the **Load Default** button and load the default settings of the **VLAN** groups.

TRUNKING

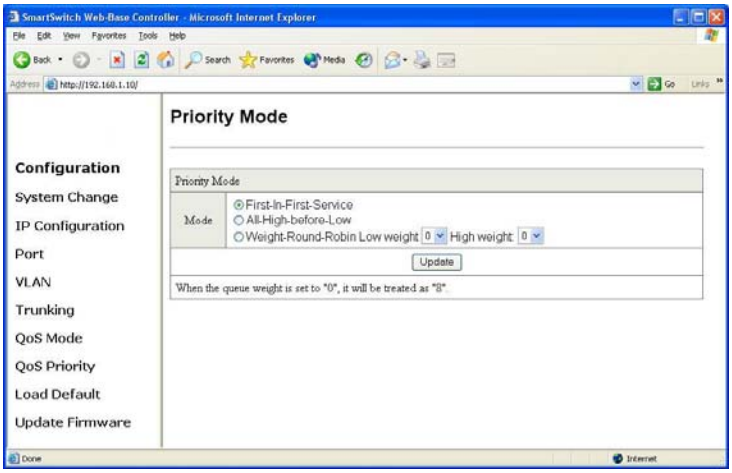
The **Trunking** parameters can be displayed by clicking the **Trunking** selection in the left sub-menu.


SmartSwitch Web-Base Controller - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://192.168.1.10/
Go
Trunk Configuration
Configuration
System Change
IP Configuration
Port
VLAN
Trunking
QoS Mode
QoS Priority
Load Default
Update Firmware
Trunk Hash Algorithm Selection
Port ID SA DA SA & DA
Trunk0
Port1 Port2 Port3 Port4
Trunk1
Port5 Port6 Port7 Port8
Update
1.Selecting one port for a trunk will treated as a void setting.
2.The trunk group members must are also vlan members.
3.Don't connect both trunks channels to a single switch, this will cause unlimited traffic loop once a broadcast packet is coming to any port of the switch.
Internet

- Trunk Hash Algorithm Selection: Click and choose **Port ID**, **SA**, **DA**, or **SA & DA Trunk Hash Algorithm**.
- Trunk0: Click and choose **Port1 ~ Port4** to be added into the **Trunk0**.
- Trunk1: Click and choose **Port5 ~ Port8** to be added into the **Trunk1**.
- Update: Click the **Update** button and apply the new settings of the **Trunking** Groups.

QoS Mode

The **QoS Mode** parameters can be displayed by clicking the **QoS Mode** selection in the left sub-menu.

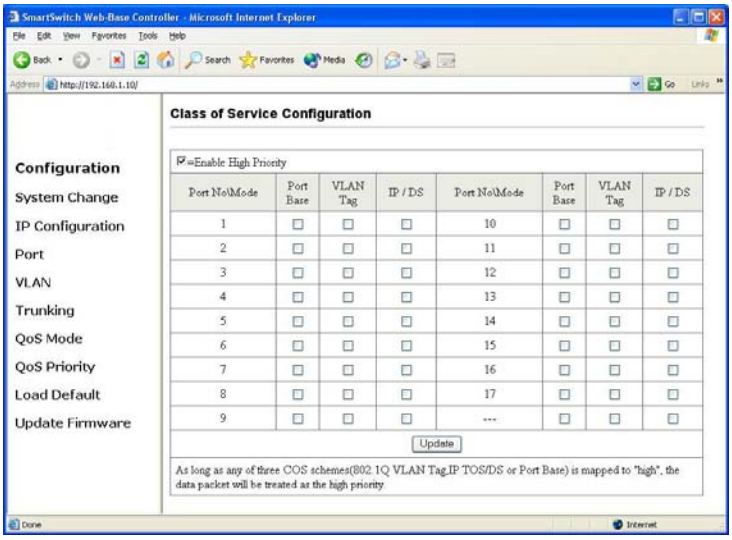


- Click and choose **First-In-First-Service, All-High-before-Low,** or **Weight-Round-Robin** Priority Mode.

  ⓘ The Priority Mode will be treated as “8” when both **Low weight** and **High weight** of **Weight-Round-Robin** are set to “0”.
- Update: Click the **Update** button and apply the new settings of the **QoS Mode**.

QoS PRIORITY

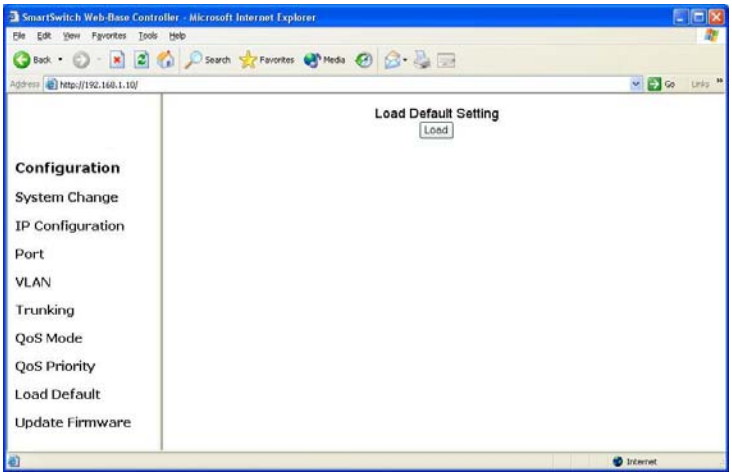
The **QoS Priority** parameters can be displayed by clicking the **QoS Priority** selection in the left sub-menu.



- Click and choose **Port Base, VLAN Tag,** and/or **IP / DS** for Port No 1 ~ 17.
- Update: Click the **Update** button and apply the new settings of the **QoS Priority**.

LOAD DEFAULT

The **Load Default** parameters can be displayed by clicking the **Load Default** selection in the left sub-menu.

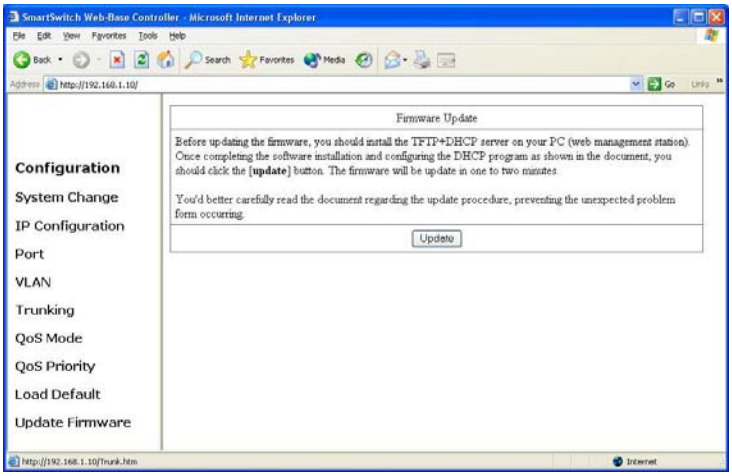


- Click the **Load** button to load the default settings.

  ⓘ Once the **Load** button is selected, all last saved **Port, VLAN, Trunking, QoS Mode** and **QoS Priority** settings will be reverted back to the default settings.

FIRMWARE UPDATE

The **Firmware Update** parameters can be displayed by clicking the **Firmware Update** selection in the left sub-menu.


SmartSwitch Web-Base Controller - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://192.168.1.10/
Go
Configuration
System Change
IP Configuration
Port
VLAN
Trunking
QoS Mode
QoS Priority
Load Default
Update Firmware
Firmware Update
Before updating the firmware, you should install the TFTP+DHCP server on your PC (web management station). Once completing the software installation and configuring the DHCP program as shown in the document, you should click the [update] button. The firmware will be update in one to two minutes.
You'd better carefully read the document regarding the update procedure, preventing the unexpected problem form occurring.
Update
http://192.168.1.10/Trunk.htm
Internet

- Click the **Firmware Update** button to update firmware to the switch. The TFTP protocol is used to upload firmware to the switch. You should install the TFTP & DHCP server on your PC (Web management station) before updating the firmware.

Technical Specifications

	16 Ports Web-based Smart Ethernet Switch
Applicable Standards	IEEE 802.3 10BaseT IEEE 802.3u 100BaseTX/FX
Fixed Ports	Sixteen ports for the 16-Port Switch
Optional 1-port Module Type	100BaseFX multi-mode or single-mode module
Speed	100BaseTX/FX: 200Mbps for full-duplex; 100Mbps for half-duplex 10BaseT: 20Mbps for full-duplex; 10Mbps for half-duplex
Switching Method	Store-and-Forward
Performance	148,810pps forwarding rate per port for 100Mbps 14,881pps forwarding rate per port for 10Mbps
Chassis LED Indicators	Power TX port: Link/ACT; SPEED (2 LEDs) FX port: Link/ACT (1 LED)

Physical Specifications

	16 Ports Web-based Smart Ethernet Switch
Dimensions	17.3 x 8.2 x 1.74 in. (W440 × D207 × H44 mm) 19” rack mount size, 1U high
Weight	Approximately 6.2 pounds (2.8kg)
Power Input	100 ~ 240 VAC, 50~60 Hz
Power Dissipation	7.4W Maximum
Operating Temperature	0° ~ 45°C (32° ~ 113°F)
Storage Temperature	-10° ~ 70°C (14° ~ 158°F)
Humidity	10 ~ 90%, non-condensing
Emissions	FCC part 15 Class A, CE Mark

Connector Pinouts

Pin arrangement of RJ-45 connectors:

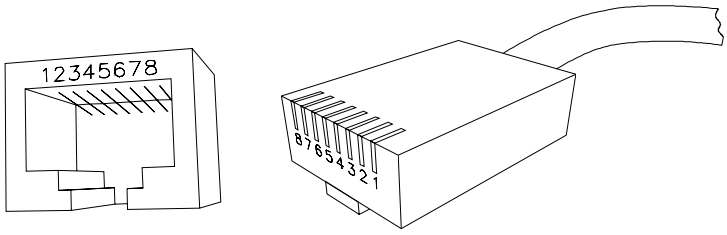


Figure 4: RJ-45 Connector and Cable Pins

The following table lists the pinout of 10/100BaseT/TX ports.

Connector Pin-Out

Pin	Regular Ports	Uplink port
1	Input Receive Data +	Output Transmit Data +
2	Input Receive Data -	Output Transmit Data -
3	Output Transmit Data +	Input Receive Data +
4	NC	NC
5	NC	NC
6	Output Transmit Data -	Input Receive Data -
7	NC	NC
8	NC	NC

Ordering Information

16 Fixed Ports		**Single-Port Module**			
Cable Connector	Distance	Speed	Cable (/125µm) Connector	Distance	✓
100BaseTX: Cat. 5 or better UTP/STP RJ-45 **OR** **10BaseT:** Cat. 3, 4, 5 or better UTP/STP RJ-45	100m	100BaseFX	MMF (50µm or 62.5µm) SC	2km	
		100BaseFX	MMF (50µm or 62.5µm) ST	2km	
		100BaseFX	MMF (50µm or 62.5µm) MT-RJ	2km	
		100BaseFX	MMF (50µm or 62.5µm) VF-45	2km	
		100BaseFX	MMF (50µm or 62.5µm) LC	2km	
		100BaseFX	SMF (9µm or 10µm) SC	Up to 120km	
		100BaseFX	SMF (9µm or 10µm) ST	Up to 20km	
		100BaseFX	WDM SMF (9µm or 10µm) SC	Up to 40km	

ⓘ

i. The maximum node-to-node network distance is in full-duplex operation.
ii. MMF denotes Multi-Mode Fiber. SMF denotes Single-Mode Fiber.